REMARKS

Applicant has now carefully considered all aspects of the above-identified Office Action and in consideration thereof has extensively amended the claims of this application in order to completely and patentably distinguish all art of record. Such art notably includes the U.S. Patent No. 5,866,905 (Kakibayashi et al.) which has been relied upon by the Examiner as the sole art basis for rejection of the original claims. As now presented it is believed that all remaining claims are fully allowable and favorable reconsideration is respectfully requested.

With respect to the amended claims it will be seen that claim 1 has been extensively amended. Claims 3 and 8-10 have been canceled; and new claims 11-14 added. Claim 11 is a new claim dependant on claim 1. Claims 12 to 14 are apparatus claims which replace former claims 8 through 10. The new apparatus claims are closely modeled on the amended method claims.

Briefly with respect to the drawings, Applicant is submitting herewith a revised set of drawings for the Examiner's approval. It is believed that these drawings will remove the prior objections to the filed informal drawings.

Turning more specifically, however, to the substantive aspects of the Examiner's rejection, it initially is believed important to emphasize those aspects of the present invention which are distinctive, particularly with respect to the relied upon prior art.

It is thus important to appreciate that the present claims, notably see claim 1, specifically relate to a microscope which functions with light illumination as opposed to a microscope as in Kakibayashi et al., which is based on electron beam scanning. The present microscope as is set forth at great length in the specification, is concerned with examination of a relatively thick specimen (*e.g.* a pathological specimen) which is illuminated by such

incident light. Under these conditions the light penetrates below the specimen surface and illuminates portions of the specimen throughout the thickness of same. The difficulty that this creates in the present light-based microscope, again as is considered at length in the present specification, is that where one uses the microscope to image a specific focal plane of interest (forming one of a plurality of such planes defining the thickness of the specimen) the light microscope since it illuminates as well planes which are displaced, *e.g.*, below (or above) the focal plane of interest, also illuminates portions of the specimen in these additional planes. This in turn results in out of focus points in these other planes also being imaged, confusing and indeed degrading the image from the desired focal plane. The present invention is especially applicable to a tomographic microscope of the type discussed, where accordingly the objective is to obtain a series of accurately presented images of focal planes running across the specimen for the thickness thereof, so that ultimately a three dimensional volumetric image may be constructed by stacking these plural images. Obviously it is highly significant, and indeed imperative to avoid the contamination of the focal plane images by objects which are not in the focal plane, a result due to the nature of the illuminated microscope. In contrast, although Kakibayashi et al., also creates a three dimensional image, Kakibayashi et al.'s image is a three dimensional reconstruction of the surface of the specimen and not a volumetric reconstruction, as is possible with the present tomographic microscope.

As now amended claim 1 clearly emphasizes the aforementioned principles of the invention. First it makes clear that the microscope in its broadest aspect is concerned with a light illuminated specimen and that such specimen has a thickness exceeding the depth of focus of the viewing microscope. Also made clear is the objective to suppress imaging of objects which are displaced and out of focus with respect to the focal plane of interest.

In order to achieve this claim 1 recites the steps that one obtains a plurality of images of the focal plane of interest, but that these images are taken at different angles of specimen illumination (in contrast with Kakibayashi et al., which rotates the specimen, not the illumination). Thereupon information is cross-correlated from the angled views by suppressing information that is not common to each angled view while substantially retaining information for the plane that is common for all angled views. This provides a confocal emulated image for the plane being examined. Then in claim 2 Applicant goes on to add the additional step of stacking the plurality of such confocal emulated images representing the thickness of the sample to produce a three dimensional reconstruction of the specimen. The further method claims recite more specific limitations imposed on this basic method, and it is clear that they too should be allowable along with claims 1 and 2.

As already mentioned, new claims 12, 13, and 14 are closely modeled on the method claims, and are essentially apparatus versions of the latter. They are believed allowable for the same reasons.

The distinctions between the present device (as now claimed) and the Kakibayashi et al. reference are fundamental. Kakibayashi et al. relates to a scanning electron microscope. There is no concern in such reference with examining a specimen at a focal plane of interest, where other planes in the sample are out of such focal plane. Kakibayashi's scanning electron microscope does not penetrate successive planes in a thick sample. Indeed the specimen examined in Kakibayashi et al. has a thickness of a but few atoms, and the electron microscope essentially looks at and scans the surface of such specimen. Hence there is no concern in Kakibayashi with the problem which is addressed by the present invention, and which therefore provides unique means for solving that problem. What Kakibayashi actually is concerned with is the conventional mode of using an electron beam to scan an ultra thin

sample, in which one looks at an essentially two dimensional plane at different angles. Kakibayashi et al. use the differing two dimensional views to construct a three dimensional representation of the atomic arrangement. In Kakibayashi et al. such scanning results in an image showing the "surface" of the very thin specimen "in three dimensions", in the sense that one can look at that surface not merely from a normal view, but also for example from the sides of the surface so that one can see the vertical spacing of the atoms. A careful reading of the limitations now present in the entirety of Applicant's claims will render clear that the limitations now imposed by Applicant to define their invention in claim 1 are distinct, and simply cannot be deemed present in the electron scanning microscope of the Kakibayashi et al. reference.

In view of the foregoing amendments and remarks, it is deemed that as now presented all claims are fully and patentably distinguished from the cited prior; and accordingly favorable reconsideration and an early Notice of Allowance are respectfully solicited.

Respectfully submitted,

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